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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/449,250	11/24/1999	MI-SUEN LEE	PHA-23-859	6048

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EXAMINER

KIM, CHONG R

ART UNIT

PAPER NUMBER

2623

DATE MAILED: 09/25/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)	
09/449,250	LEE, MI-SUEN	
Examiner	Art Unit	
Charles Kim	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

1. Claims 1-3, 5, 9-11, 13, and 18-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Courtney (U.S. Patent No. 5,969,755).

Referring to claim 1, Courtney discloses a method for detecting an object of interest in an image processing system, the method comprising the steps of:

- a. generating a difference image (col. 6, lines 22-25)
- b. segmenting the difference image into a plurality of regions (col. 6, lines 27-31 and figure 7f)

- c. identifying one or more silhouette candidates in at least a subset of the regions (col. 7, lines 52-60 and figure 7f. Note that the “shape mask” in line 59 is interpreted as being analogous to a silhouette candidate)
- d. detecting the object of interest based at least in part on the identified silhouettes (col. 7, lines 61-67).

Referring to claim 9, see the rejection of at least claim 1 above. Courtney further discloses a camera (element 11 in figure 1).

Referring to claims 2 and 10, Courtney further discloses that the object of interest is a moving person (figure 4).

Referring to claims 3 and 11, Courtney further discloses that the difference image comprises a thresholded difference image generated by taking a difference between a first image and a second image and applying binary thresholding to the resulting difference (col. 5, lines 64-67).

Referring to claims 5 and 13, Courtney further discloses that the regions of the image which includes a silhouette candidate includes only a single silhouette candidate (figure 7f).

Referring to claim 18, Courtney further discloses that the image processing system comprises a video surveillance system (col. 2, lines 29-34).

Referring to claim 19, Courtney further discloses that the image processing system comprises a human-machine interface (element 28 in figure 5).

Referring to claim 20, see the rejection of claim 1 above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Courtney (U.S. Patent No. 5,969,755).

Referring to claims 4 and 12, Courtney discloses that the difference image is segmented into a plurality of regions as disclosed above, such that each of the regions are bounded by vertical lines (col. 7, line 58. Note that the "bounding box" includes two vertical lines). Although Courtney does not explicitly state that the vertical lines pass through the entire image, it would have been obvious to extend the vertical lines of the "bounding box" so that it passes through the entire image; in order to separate the plurality of regions for easy detection of the object of interest (Note that the plurality of regions in figure 7f can be separated by vertical lines that pass through the entire image).

3. Claims 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Courtney (U.S. Patent No. 5,969,755), in further view of the article entitled "Grouping -, -->, into Regions, Curves, and Junctions" by Lee et al. ("Lee").

Referring to claims 6 and 14, Courtney fails to disclose the step of determining saliency values for each of the silhouette candidates using tensor voting.

However, Lee teaches the determination of saliency values using tensor voting (pages 55-56 under the section labeled "TENSORIAL FRAMEWORK FOR SALIENT STRUCTION INFERENCE").

Therefore, since Lee teaches that the saliency values allows for the identification of features such as points or curve elements (page 57), it would have been obvious to determine the saliency values for each of the silhouette candidates of Courtney, by the tensor voting method of Lee, since the silhouette candidates are characterized by curve elements (Courtney, col. 7, line 59 and figure 7f), and the determination of the saliency values for each of the silhouette candidates would result in the identification of the curve element features. Furthermore, one would be motivated to incorporate the tensor voting method of Lee, since it efficiently collects information in a large neighborhood containing any combination of points, curve elements, or surface patch elements, which would allow for the interpolation, discontinuity detection, and outlier identification of the silhouette candidate simultaneously (Lee, page 54, third paragraph under "INTRODUCTION").

4. Claims 7, 8, 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Courtney (U.S. Patent No. 5,969,755), in further view of Gibbon (E.P. Patent No. 0 635 983 A2).

Referring to claims 7 and 15, Courtney fails to disclose the step of detecting a neck position of the moving person.

However, Gibbon teaches the step of detecting a neck position of a moving person (figure 10) by analyzing a sum of x-components of tangents along a corresponding silhouette (page 5, lines 29-57. Note that the neck position is located at a "feature point", which is detected by

determining the derivative along the corresponding silhouette (curve), and locating the significant zero crossings. It is further noted that this determination of the zero crossings of the derivative of the silhouette is analogous to analyzing a sum of x-components of tangents along the silhouette, since the tangent of a line is defined by the derivative of the line).

Therefore, since Courtney and Gibbon are both concerned with the detection of a moving person by generating difference images, it would have been obvious to detect the neck position of the silhouette of Courtney, by the method taught by Gibbon, in order to determine the position and the size of the moving person's head (Gibbon, page 6, lines 16-17).

Referring to claims 8 and 16, Gibbon further discloses that the detected neck position is utilized to determine the size and position of the moving person's head (page 6, lines 16-17).

Referring to claim 17, Courtney fails to explicitly state that the image processing system comprises a video conferencing system. However, Gibbon teaches that the image processing system comprises a video conferencing system (page 3, lines 3-4. Note that "visual communication" in line 4 is interpreted as being analogous to video conferencing).

Therefore, since Courtney and Gibbon are both concerned with detecting a moving person, as disclosed above, it would have been obvious to include the video conferencing system of Gibbon, in the image processing system of Courtney.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Kim U.S. Patent No. 6,360,002 discloses an object extracting method using motion picture.
- b. Chang U.S. Patent No. 5,734,737 discloses a method for segmenting and estimating a moving object motion using motion models.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 703-306-4038. The examiner can normally be reached on Monday thru Thursday 8:30am to 6:00pm and alternating Fridays 9:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

CK
ck

September 10, 2002


AMELIA N. AU
SUPERVISORY PATENT EXAMINER
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